PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in and relating to Adjustable Coil Spring Anchorages

We, HENRY TURNER and THOMAS BROWN, both of 84, John Street, Sheffield, 2, and both of British nationality, do hereby declare the nature of this invention to be as follows:—

This invention relates to adjustable coil spring anchorages.

In many applications of coil springs, especially in cases where the coil spring is utilized for measurement of a load, as in spring balances and pressure gauges for pneumatic tyres, for example, it is desirable to be able to adjust the effective length of the spring with some precision and various adjustable anchorages have been proposed to this end.

According to the present invention an adjustable coil spring anchorage comprises a web or projection substantially perpendicular to the axis of the spring, discontinuous circumferentially of the spring and extending between adjacent convolutions of the spring, and locking means capable of being rendered effective at will for preventing relative rotation of the spring and the web or projection about the axis of the spring.

In use the web or projection against which one of the convolutions of the spring abuts forms the termination of the active or effective portion of the spring and thus the effective length of the spring is determined by the point upon the spring wire which bears against the web or projection. This point may be varied along the spring wire, to vary the effective length of the spring, by rotating the spring and web or projection relatively to one another about the spring axis whereby the spring is screwed axially relative to the web or projection. After such screwing has been carried out and the effective length of the spring has been adjusted the locking means is rendered effective to prevent any further relative rotation of the spring and the web or projection.

The locking means preferably comprises an end of the spring wire which is permanently displaced from its normal circumferential direction into a direction having a component radial of the spring and engages a slot or hole in a separate locking member which is capable of being locked or clamped against rotation relative to the web or projection. This locking member may comprise a cylindrical portion entering co-axially within or embracing the end of the spring and transversely slotted to receive the displaced end wire of the spring.

The web or projection may conveniently be wholly in a plane substantially perpendicular to the spring axis and, in order to provide the required circumferential discontinuity it may extend over a segment only of the cross section of the spring. Alternatively the web or projection may be helical and co-axial with the spring.

The web or projection may be carried internally by a hollow cylindrical terminal member embracing the spring co-axially although in some cases the web or projection might well be carried externally by a cylindrical terminal member entering within the spring. In the former case the terminal member preferably comprises a hollow cylindrical thimble or sleeve having a segment only at one end closed by a web perpendicular to the axis. In the latter case the web may be a segmental external flange perpendicular to the axis.

In the former case the locking member may comprise a sleeve or spigot fitting within the spring and transversely slotted to receive an end of the spring wire which is displaced from its normal position substantially across the diameter of the spring. Both the terminal member and the locking member may be flanged and locking may be effected by clamping the two flanges securely together. In the latter case the locking member may be a tube embracing the spring and slotted to receive an out-turned end of the spring.

In one preferred construction of an adjustable spring anchorage in accordance with the invention, which is particularly suitable for employment in conventional pneumatic tyre pressure gauges, the terminal member comprises a cylindrical sleeve or thimble at one end of which is an external flange. The other end is partially closed by a transverse segmental rib extending in a plane at righ angles to the

[*Price* 1/-]

axis. This web is engaged between adjacent convolutions of the spring which, by rotation about its axis relative to the thimble or sleeve, is screwed into the latter or out of the latter until the spring is judged to have the correct effective length.

The end of the wire of the spring is inturned from its circumferential position to a position extending substantially across the diameter of the spring. This inturned end of the wire serves to cooperate with diametrical slots in a cylindrical locking member which enters within the spring. The cylindrical locking member is a sleeve slotted diametrically at one end and along its length and flanged at the other end.

After the effective length of the spring has been adjusted the slotted end is inserted within the flanged end within the terminal member and within the spring so that the slot thereof engages the displaced wire end and the flange thereof bears against the flange of the terminal member. The two flanges are then lamped securely together to prevent rotation of the locking member and spring relative to the terminal member. When the spring is employed in a tyre pressure gauge of conventional type the flanges of the locking member and terminal member may be clamped together between the coupling head of the gauge and the sleeve or stem thereof which is screwed into the socket of the coupling head.

It will be appreciated that the above description is given by way of example only and that many modifications may be made without departing from the scope of the invention.

Dated this 6th day of July, 1938.
ARTHUR H. GREENWOOD,
Chartered Patent Agent,
39, Bank Street, Sheffield, 1.

COMPLETE SPECIFICATION

Improvements in and relating to Adjustable Coil Spring Anchorages

We, HENRY TURNER and THOMAS BROWN, both of 84, John Street, Sheffield, 2, and both of British nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to adjustable coil spring anchorages.

In many applications of coil springs, especially in cases where the coil spring is utilized for measurement as a load, as in spring balances and pressure gauges for pneumatic tyres, for example, it is desirable to be able to adjust the effective length of the spring with some precision and various adjustable anchorages have been proposed to this end.

According to the present invention an adjustable coil spring anchorage comprises a web or projection substantially perpendicular to the axis of the spring, discontinuous circumferentially of the spring and extending between adjacent convolutions of the spring, and locking means capable of being rendered effective at will for preventing relative rotation of the spring and the web or projection about the axis of the spring.

In use the web or projection, against which one of the convolutions of the spring abuts, forms the termination of the active or effective portion of the spring and thus the effective length of the spring is determined by the point upon the spring wire which bears against the web or projection. This point may be varied along the spring wire, to vary the effective length of the spring, by rotating the spring and web or projection relatively to one another about the spring axis whereby the spring is screwed axially relative to the web or projection. After such screwing has been carried out and the effective length of the spring has been adjusted the locking means is rendered effective to prevent any further relative rotation of the spring and the web or projection.

The locking means preferably comprises an end of the spring wire which is permanently displaced from its normal circumferential direction into a direction having a component radial of the spring and this displaced end of the spring wire engages a slot or hole in a separate locking member which is capable of being locked or clamped against rotation relative to the web or projection. This locking member may comprise a cylindrical portion entering co-axially within or embracing the end of the spring and transversely slotted to receive the displaced end wire of the spring.

The web or projection may conveniently be wholly in a plane substantially perpendicular to the spring axis and, in order to provide the required circumferential discontinuity, it may extend over a seg-

ment only of the cross section of the spring. Alternatively the web or projection may be helical and co-axial with the spring.

The web or projection may be carried internally by a hollow cylindrical terminal member embracing the spring co-axially although in some cases the web or projection might well be carried externally by a cylindrical terminal member entering within the spring. In the former case the terminal member preferably comprises a hollow cylindrical thimble or sleeve having a segment only at one end closed by a web perpendicular to the axis. In the latter case the web may be a segmental external flange perpendicular to the axis.

In the former case the locking member may comprise a sleeve or spigot fitting within the spring and transversely slotted to receive an end of the spring wire which is displaced from its normal position substantially across the diameter of the spring. Both the terminal member and the locking member may be flanged and locking may be effected by clamping the two flanges securely together. In the latter case the locking member may be a tube embracing the spring and slotted to receive an out-turned end of the spring.

One preferred construction of adjustable spring anchorage in accordance with the invention applied to a conventional pneumatic tyre pressure gauge is shown by way of example in the accompanying drawing in which:—

Figure 1 is a part section and part elevation on an enlarged scale:

Figure 2 is a similar view in a plane at right angles to that of Figure 1:

Figure 3 is a section on the line 3—3 of Figure 1:

Figure 4 is a section on the line 4—4 of Figure 2:

Figure 5 is an elevation of a locking member: and

Figure 6 is an elevation of a sleeve or thimble, constituting a terminal member.

Like reference numerals indicate like parts, where applicable, throughout the several figures of the drawing.

Referring now to the drawing the pressure gauge, part of which is shown, comprises a cylindrical barrel 10 to which is screwed a coupling head 11 adapted to mate with the valve nipple of a pneumatic tyre. A piston, not shown, slides within the barrel 10 and is urged away from the coupling head 11 by fluid under pressure admitted behind it into the barrel 10. The movement of the piston is controlled by a spring 12 the stiffness and length of which governs the calibration of the gauge. In order that the effect of the spring may be adjusted, the end remote from the piston is provided with an adjustable anchorage in accordance with the invention.

In the embodiment shown the adjustable anchorage comprises a terminal member in the form of a cylindrical sleeve or thimble 13, shown in elevation in Figure 6, at one end of which is an external flange 14. The other end of the thimble 13 is partially closed by a transverse segmental web 15 extending in a plane at right angles to the axis. The web 15 is engaged between adjacent convolutions of the spring 12 which, by rotation about its axis relative to the thimble or sleeve 13, is screwed into the latter or out of the latter until the spring is judged to have the correct effective length. The end 16 of the wire of the spring 12 is inturned from a circumferential position to a position extending substantially across the diameter of the spring. This inturned end 16 of the wire serves to co-operate with diametrical slots 17 in a cylindrical locking member 18, shown in elevation in Figure 5, which enters within the spring 12. This cylindrical locking member is provided with a flange 19 adapted to bear against the flange 14 of the sleeve or thimble 13 and to be clamped thereagainst between the barrel 10 and the coupling head 11 which are screwed together as shown in Figures 1 and 2.

After the effective length of the spring 12 has been adjusted the slotted end of the locking member 18 is inserted within the flanged end of the sleeve or thimble 13 and within the spring 12 so that the slot 17 engages the end 16 of the spring wire and the flange 19 bears against the flange 14. The flanges 19 and 14 are then securely clamped together, to prevent rotation of the locking member 17 and spring 12 relative to the terminal member constituted by the sleeve or thimble 13, by screwing the barrel 10 into the head 11.

It will be appreciated that the application of one particular form of the invention to a pneumatic tyre pressure gauge has been described with reference to and shown in the accompanying drawing by way of example only and that many modifications may be made without departing from the scope of the invention.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An adjustable coil spring anchorage comprising a web or projection substantially perpendicular to the axis of the spring, discontinuous circumferentially of the spring and extending between adjacent convolutions of the spring, and lock-

ing means capable of being rendered effective at will for preventing relative rotation of the spring and the web or projection about the axis of the spring.

2. An adjustable coil spring anchorage according to Claim 1 wherein the locking means comprises the end of the spring wire which is permanently displaced from its normal circumferential direction into a direction having a component radial of the spring and engages a slot or hole in a separate locking member which is capable of being locked or clamped against rotation relative to the web or projection.

3. An adjustable coil spring anchorage according to Claim 2 wherein the locking member comprises a cylindrical portion entering co-axially within or embracing the end of the spring and transversely slotted to receive the displaced end of the spring wire.

4. An adjustable spring anchorage according to any of the preceding claims wherein the web or projection is wholly in a plane substantially perpendicular to the spring axis and extends over a segment only of the cross section of the spring.

5. An adjustable spring anchorage according to any of Claims 1 to 3 inclusive wherein the web or projection is helical and co-axial with the spring.

6. An adjustable spring anchorage according to any of the preceding claims wherein the web or projection is carried internally by a hollow cylindrical terminal member embracing the spring co-axially.

7. An adjustable spring anchorage according to Claim 6 wherein the terminal member comprises a hollow cylindrical thimble or sleeve having a segment only at one end closed by a web perpendicular to the axis.

8. An adjustable spring anchorage according to Claim 3 and Claim 7 wherein the locking member and the terminal member are both similarly flanged and locking is affected by clamping the flanges securely together.

9. An adjustable spring anchorage substantially as described with reference to and shown in the accompanying drawing.

10. A tyre pressure gauge provided with an adjustable spring anchorage and locking means therefor clamped between a barrel and a coupling head substantially as described with reference to and shown in the accompanying drawing.

Dated this 30th day of June, 1939.

ARTHUR H. GREENWOOD,
Chartered Patent Agent,
39, Bank Street, Sheffield, 1.

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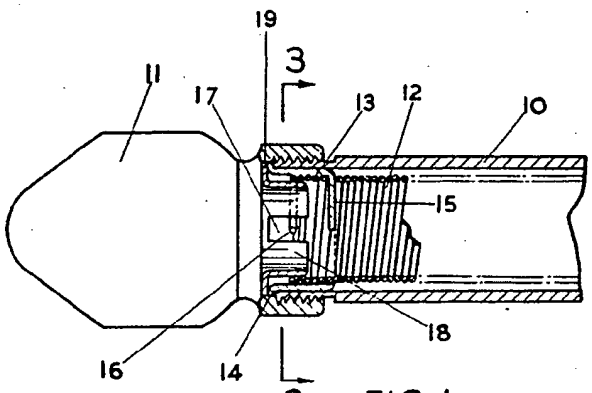

FIG. 1.

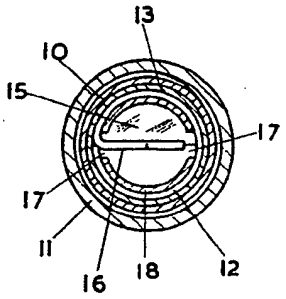

FIG. 3.

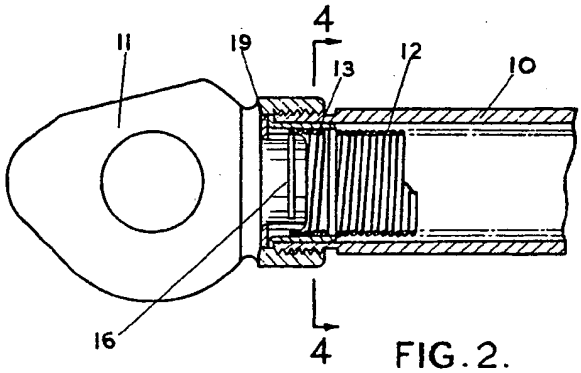

FIG. 2.

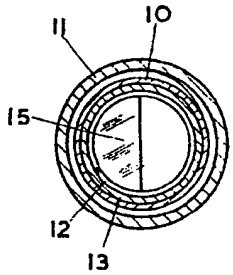

FIG. 4.

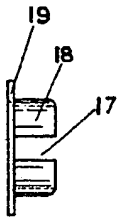

FIG. 5.

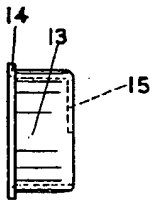

FIG. 6.

Malby & Sons, Photo-Litho.